UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,944	02/01/2001	Robert K. Jenner	1019-US	9154

25263 7590 11/12/2004

J GRANT HOUSTON
AXSUN TECHNOLOGIES INC
1 FORTUNE DRIVE
BILLERICA, MA 01821

EXAMINER	
JIMENEZ, MARC QUEMUEL	
ART UNIT	**PAPER NUMBER**
3726	

DATE MAILED: 11/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/773,944	JENNER, ROBERT K.	
	Examiner	Art Unit	
	Marc Jimenez	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/16/04 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1, 3-10, and 14-17** are rejected under 35 U.S.C. 102(e) as being anticipated by Flanders et al. (6,625,372).

Flanders et al. teach a process for aligning an optical component **100,F** by plastic deformation **720,726** (col. 13, line 25), the process comprising: finding a desired position (see figure 22, "BEST ALIGNMENT POSITION" and col. 13, lines 14-15 and 19-20, the "desired position" is the position where maximum signal is detected) of an optical axis of the

optical component **100,F** relative to a rest position (see figure 22, **722,728** and col. 13, lines 21-24, the "rest position" is the position after "snap back", it is noted that the "rest position" may not end up at the position associated with maximum coupling as described in col. 13, lines 29-33) of the optical axis of the optical component **100,F** by moving the optical axis of the optical component **100,F** along a path around the rest position **722,728**, determining a direction of the desired position ("BEST ALIGNMENT POSITION" in figure 22), and exerting a deformation force **72,726** that exceeds a yield force (col. 13, line 48) to plastically deform (col. 13, lines 48-49) the optical component so that the optical axis is moved in a direction of the desired position (col. 13, lines 14-15 and 19-20), wherein the rest position (col. 13, lines 21-24 and 29-33) is found after the desired position (col. 13, lines 14-15 and 19-20) to account for any plastic deformation induced during the step of finding the desired position (col. 13, lines 14-15 and 19-20).

Regarding claim 3, Flanders et al. teach avoiding backlash by not deforming the optical component **100,F** such that a new rest position (col. 14, lines 1-5) of the optical axis is opposed the desired position (col. 13, lines 14-15 and 19-20) with respect to a previous rest position (col. 13, lines 53-54) in a plane that is orthogonal to the optical axis.

Regarding claims 4, 7, and 16, Flanders et al. teach monitoring an active alignment signal (col. 13, lines 3-5 and 12-14) while exerting the deformation force.

Regarding claims 5, 6, 9, 10, and 15, Flanders et al. teach comparing the active alignment signal to a level of the active alignment signal when the optical component was at the desired position, and finding a new desired position relative to a new rest position, if a level of the active signal detected while exerting the deformation force is less than the level of the active alignment

signal when the optical component was at the desired position by a predetermined tolerance (col. 13, lines 13-14, the maximum signal indicates the best alignment, see also steps 664,666 in fig. 20, if not at best alignment the cycle repeats until max signal is indicated).

Regarding claims 8 and 14, the optical component **100,F** includes an optical fiber **F** having an endface and a deformable mounting structure **100** that supports the optical fiber on an optical bench **10**, and wherein the step of monitoring the active alignment signal comprises: generating and coupling an optical signal (col. 13, line 14) into the optical fiber **F**, detecting a level of backreflection of the optical signal into the optical fiber **F** through the endface as the active alignment signal.

Regarding claim 17, Flanders et al. is considered to teach "dithering" because the optical axis is determined by the successive deformation and spring back steps to obtain the desired position.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Flanders et al. in view of Applicant's Admitted Prior Art [AAPA] (page 2, lines 6-12 of applicant's specification).

Flanders et al. teach the invention cited with the exception of spectrally analyzing the optical signal for side mode suppression and using the side mode suppression as the active alignment signal.

[AAPA] teaches that it is known to determine the characteristics of light to determine the side mode suppression ratio of the system which dictates the quality of the system.

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to have provided the invention of Flanders et al. with spectrally analyzing the optical signal for side mode suppression and using the side mode suppression as the active alignment signal, in light of the teachings of [AAPA], in order to determine the quality of the system. It is noted that Flanders et al. teach spectrally analyzing the signal in fig. 22.

Response to Arguments

6. Applicant's arguments filed 8/16/04 have been fully considered but they are not persuasive.

7. Applicant argues that the applied references do not teach moving the optical axis of the optical component along a path around the rest position and determining a direction of the desired position. However, as shown in figure 22, the optical axis of the optical component is moved along a path around the rest position **710,724,728** and Flanders et al. also teach determining a direction of the desired position "BEST ALIGNMENT POSITION". In col. 13, lines 8-14, Flanders et al. teach: "Specifically, the two jaws **710A, 710B** engage handles **136** of the mounting and alignment structure **100** and then move the mounting and alignment structure to displace the fiber f in an x-y plane, which is orthogonal to the axis of the fiber f.

Simultaneously, the magnitude of the signal transmitted by the fiber is monitored until a maximum signal is detected in step **666** in FIG. **20**." Also in col. 13, lines 19-33 Flanders et al. teach: "Returning to FIG. 20, once the maximum signal is detected in step **666**, the alignment system further deforms the mounting and alignment structure **100** such that when the mounting and alignment structure is released, it will elastically snap-back to the desired alignment position detected in step **666**. In other words, the mounting and alignment structure is plastically deformed such that it will have proper alignment when the jaws **710A,710B** of the alignment system disengage from the mounting and alignment structure **100**. If it is subsequently determined in step **670** that the optical component, i.e., the fiber is not at the position associated with the maximum coupling, the deformation step **668** is performed again until the position is within an acceptable tolerance."

8. Applicant argues that the references do not teach finding a new desired position relative to a new rest position, if a level of the active detected while exerting the deformation force is less than the level of the active alignment signal when the optical component was at the desired position by a predetermined tolerance. However, in col. 14, lines 6-21, Flanders et al. teach: "Nonetheless, if optimal alignment is to be achieved, more plastic deformation must be performed. Specifically, again the elastic deformation is performed in step 730 until the yield force is reached. Then, a small amount of plastic deformation is performed as indicated by line 732. Force is removed and the mounting alignment structure now snaps back to the best alignment position as indicated by line 734. The graph insert shows the figure of merit during the alignment process. During the first plastic deformation cycle, the position passes through the best alignment position, but after force is removed, the elastic snap-back pulls it out of best

alignment. During the second deformation cycle, the best alignment position is again passed and exceeded. This second cycle, however, improves the alignment once force is removed. Finally, the third cycle brings the fiber into the best alignment position.". In col. 12, lines 39-43, Flanders et al. describes an active alignment process is used.

9. Applicant argues that the references do not teach spectrally analyzing the optical signal for side mode suppression and using the side mode suppression as the active alignment signal. However, [AAPA] teach determining side mode suppression ratio of a system which dictates the quality of the system on page 2, lines 6-12 of applicant's specification. It is noted that Flanders et al. teach spectrally analyzing the signal in figure 22.

10. In comparing figure 22 of Flanders and figure 3 of applicant's drawings, there appears to be no differences in the method for determining the desired alignment position. In applicant's figure 3, reference character p3 corresponds to the position at the end of 726 in Flanders. The rest position p1 in applicant's figure 3 corresponds to the position at the beginning of 724. The process of deforming the optical component is repeated in both Flanders and applicant's invention until the desired position p4 in applicant's figure 3 or "BEST ALIGNMENT POSITION" in Flanders figure 22 is obtained. Furthermore, both the Flanders teaching and applicant's invention is concerned with spring back after plastic deformation while actively detecting the signal. Therefore, Flanders is considered to teach the invention as claimed.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Jimenez whose telephone number is (703) 306-5965. The examiner can normally be reached on Monday-Friday between 5:30 a.m.-2:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marc Jimenez
Patent Examiner
AU 3726

MJ
November 5, 2004